Original Article

Role of Family Physicians in the Early Detection and Management of Pediatric Ocular Misalignment and Visual Acuity Disorders

PJO – Official Journal of Ophthalmological Society of Pakistan

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ABSTRACT

Purpose: To evaluate the knowledge, clinical practices, and referral approach of family physicians in Iraq regarding pediatric eye disorders, including ocular misalignments, amblyopia, and refractive errors, and to evaluate the adequacy of their training in managing these conditions.

Study Design: Cross sectional, observational study.

Place and duration of the study: Primary health care centers in Iraq**,** from March 2024 to March 2025

Methods: A total of 385 family physicians of different professional levels were enrolled in the study. They responded to a structured web-based questionnaire that addressed demographic data, clinical practice, management approaches, and self-assessment of ophthalmic training adequacy.

Results: There were 73.8% female, 55.3% medical 35.1% specialists, 35% residents and 9.7% consultants. Out of the total, 60% identified corrective glasses as treatment of refractive errors and 47.8% believed that refractive errors can cause strabismus. Eye deviation was recognized as the key clinical indicator by 49.1% while 48.3% claimed amblyopia as the primary indicator. Glasses were selected by 57.7%as the preferred option for treating strabismus, while 5.2% believed that it can resolve spontaneously. For amblyopia, 64.2% prioritized occlusion therapy, yet only 20.8% preferred referral to an ophthalmologist.

Conclusion: Limited knowledge in the correlation between the three main pediatric eye diseases and a lack of confidence in referral and treatment decisions were observed raising the need for better training, confirming standardized referral pathways, and national screening programs.

Keywords: Family Physicians, Refractive Errors, Amblyopia, Strabismus, Visual Acuity.

How to Cite this Article: Rattan SA. Role of Family Physicians in the Early Detection and Management of Pediatric Ocular Misalignment and Visual Acuity Disorders. 2026;42(3):269-274. **Doi: 10.36351/pjo.v42i3.2379**

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Received: February 15, 2026
Revised: May 1, 2026
Accepted: May 10, 2026

INTRODUCTION

Various ocular disorders can cause visual impairment in children. Ocular misalignments, amblyopia, and uncorrected refractive errors are the most common ocular problems among children.[1] Visual development, academic performance, and the child's quality of life can be significantly affected if these disorders are not identified and treated early.[2] Early diagnosis and proper management in early childhood are critical, as delays can lead to irreversible visual deficits.[3,4]

Vision- related problems affect approximately 20% of children under 18 years globally, which highlights their substantial public health burden.[5] A variable data from Iraq indicates a comparable prevalence: a study reported that refractive errors were found in 47% of children in Amara city, while in Al-Kut city the prevalence was 20.7%.[6,7] Additionally, in Baghdad, vision problems were observed in 6.14% of children attending a primary healthcare center.[8] These data reflect the widespread nature of pediatric visual

problems and highlight the need for early and effective management.

It is recommended that children have their first comprehensive ophthalmic examination between 6 and 12 months, the second between 3 and 5 years and then annual eye examination until age 17.[9] However, in several countries, including Iraq, this routine screening may be limited or inconsistently practiced.

Family physicians may be the first doctors to contact a child with pediatric health concerns and therefore have the chance to detect early signs of ocular misalignment, amblyopia, and refractive errors. To ensure timely diagnosis and management, their knowledge, clinical approach, and referral practices play a vital role. To improve management outcomes, effective collaboration with pediatric ophthalmologists is needed, which enables prompt specialist care for children who require it.[10,11] While their role is important, there are several barriers that limit family physicians' active involvement in pediatric vision care. There is inadequate training in ocular assessment, limited use of screening tools in most primary care centers, unstandardized referral patterns, and other obstacles related to the child's parents, including limited awareness and poor compliance with referral.[12,13] Furthermore, the absence of standardized screening guidelines contributes to inconsistent practices among primary care providers.[14]

The current study aims to evaluate family physicians' knowledge, attitudes, and management approaches towards common pediatric eye conditions, including ocular misalignment, amblyopia, and refractive errors. It also explains their referral behaviors and detectedbarriersto optimal care. To our knowledge, there are limited studies in Middle East that explore care provided by family physicians for common pediatric eye disorders.

METHODS

The ethical and scientific committee of Al-Kindy College of Medicine **(Reference no. 64 /Feb 2023)** approved the current study. Voluntary and anonymous participants responded to an online submitted Google form. An electronic consent form was obtained, and all responses were reviewed by a single consultant professor of ophthalmology to assess their accuracy and clinical relevance, and to ensure scientific and ethical quality of the questionnaire. The content and structure were evaluated and approved by the institution scientific committee.

It was a descriptive, cross-sectional observational survey conducted over one year, from March 2024 to March 2025. It assessed knowledge, attitudes, and management approaches of family medicine physicians towards common pediatric vision disorders in Iraq. The study included 385 family medicine physicians (consultants, specialists, and residents) who were working in government primary health care (PHC) centers in Iraq and willing to participate and provide informed consent voluntarily. Specialists from other medical disciplines, general practitioners, and Family physicians who were not working in PHC centers were excluded.

A structured, self-administered, (prepared by an ophthalmologist), web-based questionnaire was developed by using Google Forms, and the link of survey was shared through professional social media platforms. Three main domains were addressed by the questionnaire:

1. Demographic Information: Including age, gender, the current professional title (consultant/specialist/ resident), year of residency, years of clinical practice, and participation in ophthalmic trainings.
2. Attitudes and knowledge information: In this section, the knowledge of the participants regarding certain pediatric eye diseases, including refractive errors, amblyopia, and strabismus, was assessed. It also addressed their attitudes and their ability to make adequate decisions in terms of early diagnosis, referral, and management.
3. Perceived Training Adequacy: The medical training adequacy of the participants was evaluated by requesting them to detect whether their medical training was sufficient to prepare them to diagnose, manage, and refer a child with visual problems.

Responses were collected in Microsoft Excel and then analyzed using the Statistical Package for the Social Sciences SPSS, version 22. Descriptive statistics were used to summarize the data. Frequencies and percentages were calculated for categorical variables. Means with standard deviations (SD) or medians with interquartile ranges (IQR) were used to describe continuous variables, depending on their distribution. To examine the association between categorical variables, the Chi-square test was used, and means across groups were compared by analysis of variance (ANOVA). A p-value of < 0.05 was considered statistically significant.

RESULTS

The participants' ages ranged between 25 and 59 years, with a mean of 31 ± 6 years. The demographic details are listed in Table 1.

Table 1: *Demographic characteristics and clinical parameters of the study participants, N=385.*

		No.	%
Gender	Female	284	73.8
	Male	101	26.2
Current Working Status	Family medicine consultants	37	9.7
	Family medicine residents	135	35
	Family medicine specialists	213	55.3
Current Year of Residency (for residents)	First year	55	40.7
	Second year	15	11.1
	Third year	40	29.7
	Fourth year and more	25	18.5
Length of Practicing	<1 year	94	24.4
	1–4 years	192	49.9
	5–10 years	99	25.7
	> 10 years	0	0
Attended Ophthalmic Sessions	No	251	65.2
	Yes	134	34.8

Table 2: *The responses of the family physicians to the questionnaire (N=385).*

	Response	No.	Percentage
Refractive Errors Need Glasses	False	154	40.0
	True	231	60.0
	I do not know	0	0.0
Refractive Errors Cause Strabismus	False	150	39.0
	True	184	47.8
	I do not know	51	13.2
Clue for True Strabismus	Eye deviation	189	49.1
	Face turn	69	17.9
	Anomalous head posture	62	16.1
	Epicanthal fold	38	9.9
	Wide nasal bridge	27	7.0
Concerns in Strabismus	Amblyopia	186	48.3
	Cosmetically not acceptable	96	24.9
	Underlying central cause	103	26.8
Strabismus Treatment	Glasses	222	57.7
	Surgical repair	143	37.1
	Spontaneously resolving	20	5.2
	Occlusion therapy of the affected eye	247	64.2
Management of Amblyopia	Try eyeglasses	44	11.4
	Refer to an ophthalmologist	80	20.8
	Only follow up	14	3.6
Training Adequacy	Agree	184	47.8
	Disagree	201	52.2

Participants were categorized according to their clinical experience into four groups: less than one year, one to four years, five to ten years, and more than ten years. Regarding family physicians' practices in pediatric eye disorders, 25.2% of the 385 participating physicians indicated referring all newborns to an ophthalmologist, while 25.7% referred only during routine visits. The remaining reported that they did not know when to refer.

Regarding responses about refractive errors, 60.0% identified that refractive errors were treated with spectacles, while the remaining 40.0% responded incorrectly. Table 2 shows details of other responses.

Regarding treatment options for strabismus,57.7% selected glasses as the primary treatment option and for amblyopia management, 64.2% indicated that occlusion therapy was the preferred treatment. For a child with a strabismus, the physicians' approach was: 41.0% reported that they would refer the child immediately, 36.9% would recommend follow-up, and 33.8% would suggest brain imaging.

DISCUSSION

The current study reported predominance of females over males, which aligns with a broader global trend that indicates a higher percentage of females in the primary healthcare sector, particularly within primary care specialties.[15] The sample included a well-balanced representation of family physicians, 34% were consultants, 33.8% were specialists, and the residents were 32.2%, furthermore the training stages and the period of professional experience were also varied among the participants. The variation in professional degrees and level of training would enhance the assessment of knowledge across different professional levels. Among the most common pediatric eye problems are ocular misalignment, amblyopia, and refractive errors, and the current study addressed insights into the family physician's knowledge, clinical practices, and referral behaviors since early detection and prompt management are essential to avoid long-term consequences.

Regarding managing refractive errors by the primary health care providers, majority of participants correctly identified the need for corrective glasses, and the results are comparable to a previous study by Hersi et al.[10] He reported that approximately 62.5% of family physicians identified that spectacles were necessary for refractive error correction. In the presence of a high prevalence of refractive errors and their visual impact, if not properly managed, there is a

rising critical need to improve ophthalmic education and awareness among family physicians to ensure early diagnosis and adequate management of pediatric refractive errors.

Only 39% of the participants believed that strabismus can be caused by uncorrected refractive errors. In terms of the presentation, 49.1% of the participants correctly identified eye deviation as the key sign of strabismus, while the remaining participants misinterpreted features such as face turn, abnormal head posture, or epicanthal folds as signs of strabismus. This reflects confusion between true and pseudo-strabismus and may delay appropriate referral.

Corrective glasses for refractive errors as a treatment for strabismus was chosen by 57.7% of the participants indicating limited awareness of proper treatment options for a common pediatric eye disorder. Like our study, Suzan et al, explored gaps in the recognition and management of certain urgent sight-threatening pediatric eye disorders by family physicians at the primary care centers in Iraq.[16]

In terms of referral practice, only 41.0% of participants advised immediate referral to an ophthalmologist, despite this being the standard of care. Many participants also recommended unnecessary investigations, such as brain imaging, which may lead to critical delays in treatment. A lack of confidence in diagnosing and managing strabismus has been associated with underestimation of referral urgency and overutilization of diagnostic imaging, as reported by Donahue.[17] This consistent trend emphasizes an ongoing need for clearer referral guidelines to improve timely and appropriate care for children with strabismus.

Considering amblyopia management options and referral practices in our study, occlusion therapy was correctly identified by 64.2% of participants. However, referral to an ophthalmologist was indicated by only 20.8%, which is crucial for ensuring the diagnosis and personalized treatment planning. Confusionwithamblyopia therapy was evident, specifically regarding which eye to patch, revealing misperception between treating the amblyopic or the dominant eye. Additionally, eyeglasses alone were indicated by 11.4% of participants, and 3.6% selected observation. Both approaches were inadequate as a standalone option for managing amblyopia.[18]

The physician's confidence regarding pediatric ophthalmic training is variable:47.8% recognized adequate training, while 52.2% did not. This inconsistency may reflect differing levels of competence among them. Chan et al,[19]reported that80% of physicians felt only "somewhat comfortable" or "not at all comfortable" in treating common eye conditions, while the training duration was not found to be a significant predictor for confidence.[20]

However, A well-structured competency-based training program in collaboration with pediatric ophthalmologists is urgently needed to enhance knowledge, clinical practices, and self-confidence during early childhood vision screening, and to improve referral practices.

This study has several limitations. Being a questionnaire-based cross-sectional study, the findings relied on self-reported responses, which may be affected by recall bias and social desirability bias. The use of a web-based survey may also have limited participation to physicians with better internet access or greater interest in ophthalmology, introducing selection bias. In addition, the study assessed knowledge and reported practices rather than actual clinical performance, which may differ in real-life settings. The unequal distribution of professional levels among participants, with a predominance of females and medical officers, may have influenced the overall results and limited generalizability. Furthermore, as the study was conducted within a specific healthcare setting and geographic region, the findings may not fully represent all family physicians nationwide. Despite these limitations, the study provides important insights into gaps in awareness and referral practices related to common pediatric ophthalmic conditions.

CONCLUSION

Refractive errors, amblyopia and strabismus, despite being common pediatric eye problems and the known impact on child vision, the study reflects a notable gap in family physicians' knowledge and clinical practice in the management of strabismus, refractive errors, and amblyopia. Many physicians have a limited understanding of the relation between strabismus and refractive errors and a reduced level of confidence in treatment and referral decisions.

Funding: This study was not funded by any organization.

Patient's Consent: Researchers followed the guidelines set forth in the Declaration of Helsinki.

Conflict of Interest: Authors declared no conflict of interest.

Ethical Approval: The study was approved by the Institutional review board/Ethical review board **(Reference no. 64 /Feb 2023)**.

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Author's Designation and Contribution

Suzan Amana Rattan; Consultant Ophthalmologist: *Concepts, Design, Literature Search, Data Acquisition, Data Analysis, Statistical Analysis, Manuscript Preparation, Manuscript Editing, Manuscript Review.*